

In the Claims:

Please amend the claims as shown below.

1. (currently amended) A method for determining the position of a user terminal, comprising:

receiving at the user terminal a plurality of digital television (DTV) broadcast signals from a plurality of DTV transmitters, wherein each of the DTV signals is a European Telecommunications Standards Institute (ETSI) Digital Video Broadcasting - Terrestrial (DVB-T) signal;

determining a pseudo-range between the user terminal and each DTV transmitter based on the DTV broadcast signals ~~based on a known component in the DTV signals~~; and

determining a position of the user terminal based on the pseudo-ranges and a location of each of the DTV transmitters.

2. (original) The method of claim 1, wherein determining a position of the user terminal comprises:

adjusting the pseudo-ranges based on a difference between a transmitter clock at one of the DTV transmitters and a known time reference; and

determining the position of the user terminal based on the adjusted pseudo-ranges and the location of each of the DTV transmitters.

3. (original) The method of claim 1, wherein the known component is a scattered pilot carrier.

4. (original) The method of claim 1, wherein determining a position of the user terminal comprises:

determining an offset between a local time reference in the user terminal and a master time reference; and

determining the position of the user terminal based on the pseudo-ranges, the location of each of the DTV transmitters, and the offset.

5. (original) The method of claim 4, further comprising:
determining a subsequent position of the user terminal using the offset.
6. (original) The method of claim 1, wherein determining a pseudo-range comprises:
storing a portion of each of the DTV signals; and
subsequently correlating each of the stored portions and a signal generated by the user terminal to produce the pseudo-ranges.
7. (original) The method of claim 1, wherein determining a pseudo-range comprises:
correlating each of the DTV signals with a signal generated by the user terminal as the DTV signals are received to produce the pseudo-ranges.
8. (original) The method of claim 1, wherein determining a position of the user terminal comprises:
determining a general geographic area within which the user terminal is located; and
determining the position of the user terminal based on the pseudo-ranges and the general geographic area.
9. (original) The method of claim 8, wherein the general geographic area is a footprint of an additional transmitter communicably linked to the user terminal.
10. (original) The method of claim 1, wherein determining a position of the user terminal comprises:
determining a tropospheric propagation velocity in a vicinity of the user terminal;
adjusting the value of each pseudo-range based on the tropospheric propagation velocity;
and
determining the position of the user terminal based on the adjusted pseudo-ranges and the location of each of the DTV transmitters.

11. (original) The method of claim 1, wherein determining a position of the user terminal comprises:

adjusting each pseudo-range based on a terrain elevation in a vicinity of the user terminal;
and

determining the position of the user terminal based on the adjusted pseudo-ranges and the location of each of the DTV transmitters.

12. (original) The method of claim 1, further comprising:

selecting the DTV signals based on an identity of an additional transmitter communicably linked to the user terminal and a stored table correlating the additional transmitter and the received DTV broadcast signals.

13. (original) The method of claim 1, further comprising:

accepting a location input from a user; and
selecting the DTV signals based on the location input.

14. (original) The method of claim 1, further comprising:

scanning available DTV signals to assemble a fingerprint of the location; and
selecting the DTV broadcast signals used to determine the pseudo-ranges based on the fingerprint and a stored table that matches known fingerprints with known locations.

15. (original) The method of claim 1, further comprising:

using receiver autonomous integrity monitoring (RAIM) to check the integrity of each pseudo-range based on redundant pseudo-ranges from the DTV transmitters.

16. (original) A method for determining the position of a user terminal, comprising:

receiving at the user terminal a plurality of digital television (DTV) broadcast signals from a plurality of DTV transmitters, wherein each of the DTV signals is a European Telecommunications Standards Institute (ETSI) Digital Video Broadcasting - Terrestrial (DVB-T) signal;

determining a pseudo-range between the user terminal and each DTV transmitter based on the DTV broadcast signals; and

transmitting the pseudo-ranges to a location server configured to determine a position of the user terminal based on the pseudo-ranges and a location of each of the DTV transmitters.

17. (original) The method of claim 16, wherein determining a pseudo-range comprises: determining a time of transmission from one of the DTV transmitters of a known component of the DTV broadcast signal;

determining a time of reception at the user terminal of the known component; and determining the difference between the time of transmission and the time of reception.

18. (original) The method of claim 16, wherein the known component is a scattered pilot carrier.

19. (original) The method of claim 16, wherein determining a pseudo-range comprises: storing a portion of each of the DTV signals; and subsequently correlating each of the stored portions and a signal generated by the user terminal to produce the pseudo-ranges.

20. (original) The method of claim 16, wherein determining a pseudo-range comprises: correlating each of the DTV signals with a signal generated by the user terminal as the DTV signals are received to produce the pseudo-ranges.

21. (currently amended) A method for determining the position of a user terminal, comprising:

receiving a plurality of pseudo-ranges from a user terminal, each pseudo-range determined between the user terminal and one of a plurality of DTV transmitters based on DTV signals broadcast by the DTV transmitters, wherein each of the DTV signals is a European Telecommunications Standards Institute (ETSI) Digital Video Broadcasting - Terrestrial (DVB-

T) signal, and wherein the pseudo-ranges are determined based on a ~~known component in the~~ DVB-T signals; and

determining a position of the user terminal based on the pseudo-ranges and a location of each of the DTV transmitters.

22. (original) The method of claim 21, wherein determining a position of the user terminal comprises:

adjusting the pseudo-ranges based on a difference between a transmitter clock at one of the DTV transmitters and a known time reference; and

determining the position of the user terminal based on the adjusted pseudo-ranges and the location of each of the DTV transmitters.

23. (original) The method of claim 21, wherein the known component is a scattered pilot carrier.

24. (original) The method of claim 21, wherein determining a position of the user terminal comprises:

determining an offset between a local time reference in the user terminal and a master time reference; and

determining the position of the user terminal based on the pseudo-ranges, the location of each of the DTV transmitters, and the offset.

25. (original) The method of claim 24, further comprising:

determining a subsequent position of the user terminal using the offset.

26. (original) The method of claim 21, wherein determining a position of the user terminal comprises:

determining a general geographic area within which the user terminal is located; and

determining the position of the user terminal based on the pseudo-ranges and the general geographic area.

27. (original) The method of claim 26, wherein the general geographic area is a footprint of an additional transmitter communicably linked to the user terminal.

28. (original) The method of claim 21, wherein determining a position of the user terminal comprises:

determining a tropospheric propagation velocity in a vicinity of the user terminal;
adjusting the value of each pseudo-range based on the tropospheric propagation velocity;

and

determining the position of the user terminal based on the adjusted pseudo-ranges and the location of each of the DTV transmitters.

29. (original) The method of claim 21, wherein determining a position of the user terminal comprises:

adjusting each pseudo-range based on the terrain elevation in the vicinity of the user terminal; and

determining the position of the user terminal based on the adjusted pseudo-ranges and the location of each of the DTV transmitters.

30. (currently amended) An apparatus for determining the position of a user terminal, comprising:

means for receiving at the user terminal a plurality of digital television (DTV) broadcast signals from a plurality of DTV transmitters, wherein each of the DTV signals is a European Telecommunications Standards Institute (ETSI) Digital Video Broadcasting - Terrestrial (DVB-T) signal;

means for determining a pseudo-range between the user terminal and each DTV transmitter based on a ~~known component~~ in the DTV broadcast signals; and

means for determining a position of the user terminal based on the pseudo-ranges and a location of each of the DTV transmitters.

31. (original) The apparatus of claim 30, wherein means for determining a position of the user terminal comprises:

means for adjusting the pseudo-ranges based on a difference between a transmitter clock at one of the DTV transmitters and a known time reference; and

means for determining the position of the user terminal based on the adjusted pseudo-ranges and the location of each of the DTV transmitters.

32. (original) The apparatus of claim 31, wherein the known component is a scattered pilot carrier.

33. (original) The apparatus of claim 30, wherein means for determining a position of the user terminal comprises:

means for determining an offset between a local time reference in the user terminal and a master time reference; and

means for determining the position of the user terminal based on the pseudo-ranges, the location of each of the DTV transmitters, and the offset.

34. (original) The apparatus of claim 33, further comprising:

means for determining a subsequent position of the user terminal using the offset.

35. (original) The apparatus of claim 30, wherein means for determining a pseudo-range comprises:

means for storing a portion of each of the DTV signals; and

means for subsequently correlating each of the stored portions and a signal generated by the user terminal to produce the pseudo-ranges.

36. (original) The apparatus of claim 30, wherein means for determining a pseudo-range comprises:

means for correlating each of the DTV signals with a signal generated by the user terminal as the DTV signals are received to produce the pseudo-ranges.

37. (original) The apparatus of claim 30, wherein means for determining a position of the user terminal comprises:

means for determining a general geographic area within which the user terminal is located; and

means for determining the position of the user terminal based on the pseudo-ranges and the general geographic area.

38. (original) The apparatus of claim 37, wherein the general geographic area is a footprint of an additional transmitter communicably linked to the user terminal.

39. (original) The apparatus of claim 30, wherein means for determining a position of the user terminal comprises:

means for determining a tropospheric propagation velocity in the vicinity of the user terminal;

means for adjusting the value of each pseudo-range based on the tropospheric propagation velocity; and

means for determining the position of the user terminal based on the adjusted pseudo-ranges and the location of each of the DTV transmitters.

40. (original) The apparatus of claim 30, wherein means for determining a position of the user terminal comprises:

means for adjusting each pseudo-range based on a terrain elevation in a vicinity of the user terminal; and

means for determining the position of the user terminal based on the adjusted pseudo-ranges and the location of each of the DTV transmitters.

41. (original) The apparatus of claim 30, further comprising:

means for selecting the DTV signals based on an identity of an additional transmitter communicably linked to the user terminal and a stored table correlating the additional transmitter and the received DTV broadcast signals.

42. (original) The apparatus of claim 30, further comprising:

means for accepting a location input from a user; and

means for selecting the DTV signals based on the location input.

43. (original) The apparatus of claim 30, further comprising:

means for scanning available DTV signals to assemble a fingerprint of the location; and

means for selecting the DTV broadcast signals used to determine the pseudo-ranges based on the fingerprint and a stored table that matches known fingerprints with known locations.

44. (original) The apparatus of claim 30, further comprising:

means for using receiver autonomous integrity monitoring (RAIM) to check the integrity of each pseudo-range based on redundant pseudo-ranges from the DTV transmitters

45. (currently amended) An apparatus for determining the position of a user terminal, comprising:

means for receiving at the user terminal a plurality of digital television (DTV) broadcast signals from a plurality of DTV transmitters, wherein each of the DTV signals is a European Telecommunications Standards Institute (ETSI) Digital Video Broadcasting - Terrestrial (DVB-T) signal;

means for determining a pseudo-range between the user terminal and each DTV transmitter based on a ~~known component in the~~ DTV broadcast signals; and

means for transmitting the pseudo-ranges to a location server configured to determine a position of the user terminal based on the pseudo-ranges and a location of each of the DTV transmitters.

46. (original) The apparatus of claim 45, wherein means for determining a pseudo-range comprises:

means for determining a time of transmission from one of the DTV transmitters of a component of the DTV broadcast signal;

means for determining a time of reception at the user terminal of the component; and

means for determining the difference between the time of transmission and the time of reception.

47. (original) The apparatus of claim 45, wherein the component is a scattered pilot carrier.

48. (original) The apparatus of claim 45, wherein means for determining a pseudo-range comprises:

means for storing a portion of each of the DTV signals; and

means for subsequently correlating each of the stored portions and a signal generated by the user terminal to produce the pseudo-ranges.

49. (original) The apparatus of claim 45, wherein means for determining a pseudo-range comprises:

means for correlating each of the DTV signals with a signal generated by the user terminal as the DTV signals are received to produce the pseudo-ranges.

50. (currently amended) An apparatus for determining the position of a user terminal, comprising:

means for receiving a plurality of pseudo-ranges from a user terminal, each pseudo-range determined between the user terminal and one of a plurality of DTV transmitters based on DTV signals broadcast by the DTV transmitters, wherein each of the DTV signals is a European Telecommunications Standards Institute (ETSI) Digital Video Broadcasting - Terrestrial (DVB-T) signal, and wherein the pseudo-ranges are determined based on a known component in the DTV signals; and

means for determining a position of the user terminal based on the pseudo-ranges and a location of each of the DTV transmitters.

51. (original) The apparatus of claim 50, wherein means for determining a position of the user terminal comprises:

means for adjusting the pseudo-ranges based on a difference between a transmitter clock at one of the DTV transmitters and a known time reference; and

means for determining the position of the user terminal based on the adjusted pseudo-ranges and the location of each of the DTV transmitters.

52. (original) The apparatus of claim 50, wherein the known component is a scattered pilot carrier.

53. (original) The apparatus of claim 50, wherein means for determining a position of the user terminal comprises:

means for determining an offset between a local time reference in the user terminal and a master time reference; and

means for determining the position of the user terminal based on the pseudo-ranges, the location of each of the DTV transmitters, and the offset.

54. (original) The apparatus of claim 53, further comprising:

means for determining a subsequent position of the user terminal using the offset.

55. (original) The apparatus of claim 50, wherein means for determining a position of the user terminal comprises:

means for determining a general geographic area within which the user terminal is located; and

means for determining the position of the user terminal based on the pseudo-ranges and the general geographic area.

56. (original) The apparatus of claim 55, wherein the general geographic area is a footprint of an additional transmitter communicably linked to the user terminal.

57. (original) The apparatus of claim 50, wherein means for determining a position of the user terminal comprises:

- means for determining a tropospheric propagation velocity in a vicinity of the user terminal;

- means for adjusting the value of each pseudo-range based on the tropospheric propagation velocity; and

- means for determining the position of the user terminal based on the adjusted pseudo-ranges and the location of each of the DTV transmitters.

58. (original) The apparatus of claim 50, wherein means for determining a position of the user terminal comprises:

- means for adjusting each pseudo-range based on the terrain elevation in the vicinity of the user terminal; and

- means for determining the position of the user terminal based on the adjusted pseudo-ranges and the location of each of the DTV transmitters.

59. (currently amended) A computer program product, tangibly stored on a computer-readable medium, for determining the position of a user terminal, comprising instructions operable to cause a programmable processor to:

- receive at the user terminal a plurality of digital television (DTV) broadcast signals from a plurality of DTV transmitters, wherein each of the DTV signals is a European Telecommunications Standards Institute (ETSI) Digital Video Broadcasting - Terrestrial (DVB-T) signal;

- determine a pseudo-range between the user terminal and each DTV transmitter based on ~~a known component in~~ the DTV broadcast signals; and

- determine a position of the user terminal based on the pseudo-ranges and a location of each of the DTV transmitters.

60. (original) The computer program product of claim 59, wherein instructions operable to cause a programmable processor to determine a position of the user terminal comprise instructions operable to cause a programmable processor to:

adjust the pseudo-ranges based on a difference between a transmitter clock at one of the DTV transmitters and a known time reference; and

determine the position of the user terminal based on the adjusted pseudo-ranges and the location of each of the DTV transmitters.

61. (original) The computer program product of claim 59, wherein the known component is a scattered pilot carrier.

62. (original) The computer program product of claim 59, wherein instructions operable to cause a programmable processor to determine a position of the user terminal comprise instructions operable to cause a programmable processor to:

determine an offset between a local time reference in the user terminal and a master time reference; and

determine the position of the user terminal based on the pseudo-ranges, the location of each of the DTV transmitters, and the offset.

63. (original) The computer program product of claim 62, further comprising instructions operable to cause a programmable processor to:

determine a subsequent position of the user terminal using the offset.

64. (original) The computer program product of claim 59, wherein instructions operable to cause a programmable processor to determine a pseudo-range comprise instructions operable to cause a programmable processor to:

store a portion of each of the DTV signals; and

subsequently correlate each of the stored portions and a signal generated by the user terminal to produce the pseudo-ranges.

65. (original) The computer program product of claim 59, wherein instructions operable to cause a programmable processor to determine a pseudo-range comprise instructions operable to cause a programmable processor to:

correlate each of the DTV signals with a signal generated by the user terminal as the DTV signals are received to produce the pseudo-ranges.

66. (original) The computer program product of claim 59, wherein instructions operable to cause a programmable processor to determine a position of the user terminal comprise instructions operable to cause a programmable processor to:

determine a general geographic area within which the user terminal is located; and
determine the position of the user terminal based on the pseudo-ranges and the general geographic area.

67. (original) The computer program product of claim 66, wherein the general geographic area is a footprint of an additional transmitter communicably linked to the user terminal.

68. (original) The computer program product of claim 59, wherein instructions operable to cause a programmable processor to determine a position of the user terminal comprise instructions operable to cause a programmable processor to

determine a tropospheric propagation velocity in a vicinity of the user terminal;
adjust the value of each pseudo-range based on the tropospheric propagation velocity;
and

determine the position of the user terminal based on the adjusted pseudo-ranges and the location of each of the DTV transmitters.

69. (original) The computer program product of claim 59, wherein instructions operable to cause a programmable processor to determine a position of the user terminal comprise instructions operable to cause a programmable processor to:

adjust each pseudo-range based on the terrain elevation in the vicinity of the user terminal; and

determine the position of the user terminal based on the adjusted pseudo-ranges and the location of each of the DTV transmitters.

70. (original) The computer program product of claim 59, further comprising instructions operable to cause a programmable processor to:

select the DTV signals based on an identity of an additional transmitter communicably linked to the user terminal and a stored table correlating the additional transmitter and the received DTV broadcast signals.

71. (original) The computer program product of claim 59, further comprising instructions operable to cause a programmable processor to:

accept a location input from a user; and
select the DTV signals based on the location input.

72. (original) The computer program product of claim 59, further comprising instructions operable to cause a programmable processor to:

scan available DTV signals to assemble a fingerprint of the location; and
select the DTV broadcast signals used to determine the pseudo-ranges based on the fingerprint and a stored table that matches known fingerprints with known locations.

73. (original) The computer program product of claim 59, further comprising instructions operable to cause a programmable processor to:

use receiver autonomous integrity monitoring (RAIM) to check the integrity of each pseudo-range based on redundant pseudo-ranges from the DTV transmitters

74. (currently amended) A computer program product, tangibly stored on a computer-readable medium, for determining the position of a user terminal, comprising instructions operable to cause a programmable processor to:

receive at the user terminal a plurality of digital television (DTV) broadcast signals from a plurality of DTV transmitters, wherein each of the DTV signals is a European Telecommunications Standards Institute (ETSI) Digital Video Broadcasting - Terrestrial (DVB-T) signal;

determine a pseudo-range between the user terminal and each DTV transmitter based on ~~a known component~~ in the DTV broadcast signals; and

transmit the pseudo-ranges to a location server configured to determine a position of the user terminal based on the pseudo-ranges and a location of each of the DTV transmitters.

75. (original) The computer program product of claim 74, wherein instructions operable to cause a programmable processor to determine a pseudo-range comprise instructions operable to cause a programmable processor to:

determine a time of transmission from one of the DTV transmitters of a component of the DTV broadcast signal;

determine a time of reception at the user terminal of the component; and

determining the difference between the time of transmission and the time of reception.

76. (original) The computer program product of claim 74, wherein the component is a scattered pilot carrier.

77. (original) The computer program product of claim 74, wherein instructions operable to cause a programmable processor to determine a pseudo-range comprise instructions operable to cause a programmable processor to:

store a portion of each of the DTV signals; and

subsequently correlate each of the stored portions and a signal generated by the user terminal to produce the pseudo-ranges.

78. (original) The computer program product of claim 74, wherein instructions operable to cause a programmable processor to determine a pseudo-range comprise instructions operable to cause a programmable processor to:

correlate each of the DTV signals with a signal generated by the user terminal as the DTV signals are received to produce the pseudo-ranges.

79. (currently amended) A computer program product, tangibly stored on a computer-readable medium, for determining the position of a user terminal, comprising instructions operable to cause a programmable processor to:

receive a plurality of pseudo-ranges from a user terminal, each pseudo-range determined between the user terminal and one of a plurality of DTV transmitters based on DTV signals broadcast by the DTV transmitters, wherein each of the DTV signals is a European Telecommunications Standards Institute (ETSI) Digital Video Broadcasting - Terrestrial (DVB-T) signal, and wherein the pseudo-ranges are determined based on ~~a known component in the~~ DTV signals; and

determine a position of the user terminal based on the pseudo-ranges and a location of each of the DTV transmitters.

80. (original) The computer program product of claim 79, wherein instructions operable to cause a programmable processor to determine a position of the user terminal comprise instructions operable to cause a programmable processor to:

adjust the pseudo-ranges based on a difference between a transmitter clock at one of the DTV transmitters and a known time reference; and

determine the position of the user terminal based on the adjusted pseudo-ranges and the location of each of the DTV transmitters.

81. (original) The computer program product of claim 79, wherein the known component is a scattered pilot carrier.

82. (original) The computer program product of claim 79, wherein instructions operable to cause a programmable processor to determine a position of the user terminal comprise instructions operable to cause a programmable processor to:

determine an offset between a local time reference in the user terminal and a master time reference; and

determine the position of the user terminal based on the pseudo-ranges, the location of each of the DTV transmitters, and the offset.

83. (original) The computer program product of claim 82, further comprising instructions operable to cause a programmable processor to:

determine a subsequent position of the user terminal using the offset.

84. (original) The computer program product of claim 79, wherein instructions operable to cause a programmable processor to determine a position of the user terminal comprise instructions operable to cause a programmable processor to:

determine a general geographic area within which the user terminal is located; and

determine the position of the user terminal based on the pseudo-ranges and the general geographic area.

85. (original) The computer program product of claim 84, wherein the general geographic area is a footprint of an additional transmitter communicably linked to the user terminal.

86. (original) The computer program product of claim 79, wherein instructions operable to cause a programmable processor to determine a position of the user terminal comprise instructions operable to cause a programmable processor to:

determine a tropospheric propagation velocity in the vicinity of the user terminal;

adjust the value of each pseudo-range based on the tropospheric propagation velocity;

and

determine the position of the user terminal based on the adjusted pseudo-ranges and the location of each of the DTV transmitters.

87. (original) The computer program product of claim 79, wherein instructions operable to cause a programmable processor to determine a position of the user terminal comprise instructions operable to cause a programmable processor to:

adjust each pseudo-range based on the terrain elevation in the vicinity of the user terminal; and

determine the position of the user terminal based on the adjusted pseudo-ranges and the location of each of the DTV transmitters.